

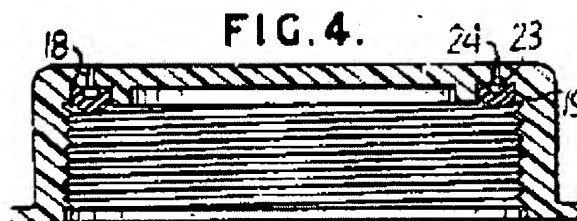
Improvements in or relating to closures for carboys and other containers

Patent number: GB887480
Publication date: 1962-01-17
Inventor:
Applicant: WILLIAM SIMON FREEMAN
Classification:
- international:
- european: B65D41/04D1; B65D51/16D3
Application number: GB19590039630 19591123
Priority number(s): GB19590039630 19591123

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Abstract of GB887480

887,480. Container closures. FREEMAN, W. S. Nov. 10, 1960 [Nov. 23, 1959], No. 39630/59. Class 125(3). A closure for relieving excess pressure in a carboy or like container comprises an annular washer 19 located in a well 18 formed on the top of a screw cap, the cap and washer being provided with venting apertures so arranged that there cannot be alignment between all the apertures in the cap and all of those in the washer. An annular channel 23 in the washer forms a passage between the apertures 24 in the cap and the apertures in the washer.



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PATENT SPECIFICATION

DRAWINGS ATTACHED



887,480

Date of filing Complete Specification Nov. 10, 1960.

Application Date Nov. 23, 1959.

No. 39630/59.

Complete Specification Published Jan. 17, 1962.

Index at acceptance:—Class 125(3), T(7F1:8H2:20C).

International Classification:—B67b.

COMPLETE SPECIFICATION

Improvements in or relating to Closures for Carboys and other Containers

- I, WILLIAM SIMON FREEMAN, a British Subject, of Subaseal Works, Peel Street, Barnsley, Yorkshire, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—
- This invention for improvements in or relating to closures for carboys and other containers, and has for one of its objects to provide a closure which will permit pressure generated inside the container to be vented without risk or leakage of the liquid in the container.
- According to the invention, there is provided a closure comprising a flexible annular washer located in a relatively rigid screw cap in position against the inner face of the head of the cap to seal against the extremity of a rim around an orifice in the container when the cap is screwed home, which closure is characterised in that the washer and the part of the head of the cap against which the washer bears are formed with perforations to vent pressure generated within the container, which perforations are of such number and/or are so spaced apart circularly that there cannot be alignment between the perforations in the cap and all of those in the washer. If desired, the perforations in the washer may be regularly spaced and those in the cap may also be regularly spaced, but the number of perforations in the washer is different from the number in the cap.
- Conveniently, an annular well is formed in the inner face of the head of the cap between the threaded wall of the later and a concentric rib, to house the washer, with which well the perforations in the cap communicate.
- The annular washer may be of semi-circular cross section with a flat face to abut against the inner face of the head of the cap, and a curved face to seal against the extremity of the rim around the orifice in the container.
- The otherwise flat face of the washer may have an annular channel formed in it, between which and the curved face of the washer the perforations extend, and the perforations in the cap should be aligned with the channel in the washer.
- The perforations in the washer and cap may be varied both in shape and size dependent on the particular venting effect desired. For instance, the perforations may be parallel-sided or may diminish in diameter, and in one particular arrangement the perforations in the cap diminish in diameter in a direction towards the exterior of the cap.
- One construction of cap according to this invention will now be described with reference to the accompanying drawings, in which:—
- Figure 1 is a perspective view of the cap from above,
Figure 2 is a top plan view of the cap,
Figure 3 is an under plan view of the cap,
Figure 4 is a section on the line 4—4 of Figure 2,
Figure 5 is a section on the line 5—5 of Figure 3,
Figure 6 is an enlarged view of part of Figure 4,
Figure 7 is a perspective view of the annular washer, and
Figure 8 is a sectional view showing the cap screwed home on a carboy.
- The cap is made of polythene and has an octagonal external surface 10 with a circular flange 11 around its open end and a threaded cylindrical interior 12 to be received upon the exterior of a rim 14 around an orifice 15 in the container with which the cap is to be used. The threaded cylindrical surface 12 terminates short of the inner face 16a of the end or head 16 of the cap and leaves a plain cylindrical wall 17 which forms one side of a well 18 in which an annular washer 19 is received. The other face of the well 18 is provided by an

annular rib 20 on the inner face 16a of the end 16 of the cap. The radial width of the annular well 18 is such that the washer 19 is a close fit therein, and the depth of the walls 17, 20 of the well are slightly less than the greatest thickness of the washer 19. The washer 19 is basically semi-circular in cross-section and the flat face 19b of the washer abuts against the portion of the inner surface of the end 16 of the cap which forms the bottom of the well 18. The washer 19 may be held in place frictionally or by an adhesive. The rim 14 around the orifice 15 in the container is able to be engaged by the curved surface 19a of the washer without contacting the walls 17, 20 of the well 18. Consequently, the cap can be screwed home firmly, distorting the washer 19 somewhat while this is being carried out.

In the illustrated construction, the washer 19 has six equi-angularly spaced parallel-sided perforations 22 which each communicate at one end with the curved surface 19a of the washer 19 and at the other end with an annular channel 23 in the flat face 19b of the washer. The width of this annular channel 23 may conveniently be rather greater than the diameter of the perforations 22.

In the illustrated construction, the cap has four equi-angularly spaced perforations 24 lying on a circle of the same diameter as the circle containing the six perforations 22 in the washer. The diameter of the perforations 24 at the inner surface of the cap is greater than that of the perforations 22 but slightly less than the width of the annular channel 23, and the diameter of the perforations decreases towards the external surface of the end 16 of the cap. It will be appreciated that if the perforations are of these numbers and spacing, there cannot be alignment between more than two of the perforations 24 in the cap and two perforations 22 in the washer 19, no matter to what position in the well 18 the washer 19 is turned, but if the latter is held in place by adhesive it can readily be so placed that there is no alignment of the perforations 22, 24.

The invention is not restricted to any particular size of any perforation, either in the washer or in the cap, nor to a particular shape or taper of perforation, as these details can be varied dependent upon the pressure for which it is desired to provide relief. The compression of the washer 19, which latter will usually be made of rubber, when the cap is screwed home on the container, will partially distort the perforations 22 in the washer. Gas, however, will be able to flow along the annular channel 23 in the washer 19 so as to reach a perforation 24 in the cap. Consequently, although gas escape will be possible, leakage of liquid is unlikely.

It is to be understood that the invention is not restricted to the precise constructional details set forth.

WHAT I CLAIM IS:—

1. A closure for a carboy or other container, comprising a flexible annular washer located in a relatively rigid screw cap in position against the inner face of the head of the cap to seal against the extremity of a rim around an orifice in the container when the cap is screwed home, characterised in that the washer and the part of the head of the cap against which the washer bears are formed with perforations to vent pressure generated within the container, which perforations are of such number and/or are so spaced apart circularly that there cannot be alignment between the perforations in the cap and all of those in the washer.
2. A closure according to Claim 1, in which the perforations in the washer are regularly spaced, and those in the cap are also regularly spaced, but the number of perforations in the washer is different from the number in the cap.
3. A closure according to Claim 1 or Claim 2, in which an annular well is formed in the inner face of the head of the cap between the threaded wall of the latter and a concentric rib, to house the washer, with which well the perforations in the cap communicate.
4. A closure according to any of the preceding claims, in which the annular washer is of semi-circular cross section with a flat face to abut against the inner face of the head of the cap, and a curved face to seal against the extremity of the rim around the orifice in the container.
5. A closure according to Claim 4, in which the otherwise flat face of the washer has an annular channel formed in it, between which and the curved face of the washer the perforations extend.
6. A closure according to Claim 5, in which the perforations in the cap are aligned with the channel in the washer.
7. A closure according to any of the preceding claims, in which the perforations are parallel-sided or diminish in diameter.
8. A closure according to Claim 7, wherein the perforations in the washer are parallel-sided and the perforations in the cap diminish in diameter in the direction towards the exterior of the cap.
9. A closure substantially as hereinbefore described with reference to the accompanying drawings.

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PROVISIONAL SPECIFICATION

Improvements in or relating to Closures for Carboys and other Containers

I, WILLIAM SIMON FREEMAN, a British Subject, of Subaseal Works, Peel Street, Barnsley, Yorkshire, do hereby declare this invention to be described in the following statement:—

This invention is for improvements in or relating to closures for carboys and other containers, and has for one of its objects to provide a closure which will permit pressure generated inside the container to be vented without risk of leakage of the liquid in the container.

According to the invention, there is provided a closure comprising a screw cap of substantially rigid material which carries a flexible annular washer located in position against the inner face of the head of the cap to seal against the extremity of a rim around an orifice in the container when the cap is screwed home, which closure is characterised in that the washer and the part of the head of the cap against which the washer bears are formed with perforations to vent pressure generated within the container, which perforations are of such number and/or are so spaced apart circularly that there cannot be alignment between the perforations in the cap and all of those in the washer. If desired, the perforations in the washer may be regularly spaced and those in the cap may also be regularly spaced, but the number of perforations in the washer is different from the number in the cap.

Conveniently, an annular well is formed in the inner face of the head of the cap between the screwed wall of the latter and a concentric rib, to house the washer, with which well the perforations in the cap communicate.

The annular washer may be of semi-circular cross section with a flat face to abut against the inner face of the head of the cap, and a curved face to seal against the extremity of the rim around the orifice in the container. The otherwise flat face of the washer may have an annular channel formed in it, between which and the curved face of the washer the perforations extend, and the perforations in the cap should be aligned with the channel in the washer.

In some circumstances, it is advantageous to arrange that each perforation in the cap diminishes in diameter in the direction towards the exterior of the cap.

In one construction according to the invention, the cap is made of polythene and has an octagonal external surface with a circular flange around its open end and a screwed cylindrical interior to be received upon the

exterior of a rim around an orifice in the container. The screwed cylindrical surface terminates a little short of the inner face of the end of the cap and leaves a plain cylindrical wall which forms one side of the aforesaid well in which the washer is received. The other face of the well is provided by an annular rib on the inner face of the end of the cap. The cross sectional width of the annular well is such that the washer is a close fit therein, and the depth of the walls of the well are slightly less than the greatest thickness of the washer. The washer may be held in place frictionally or by an adhesive. The rim around the orifice in the container is able to be engaged by the curved surface of the washer without engaging the walls of the well in which the washer is housed. Consequently, the cap can be screwed home firmly, distorting the washer somewhat while this is being carried out.

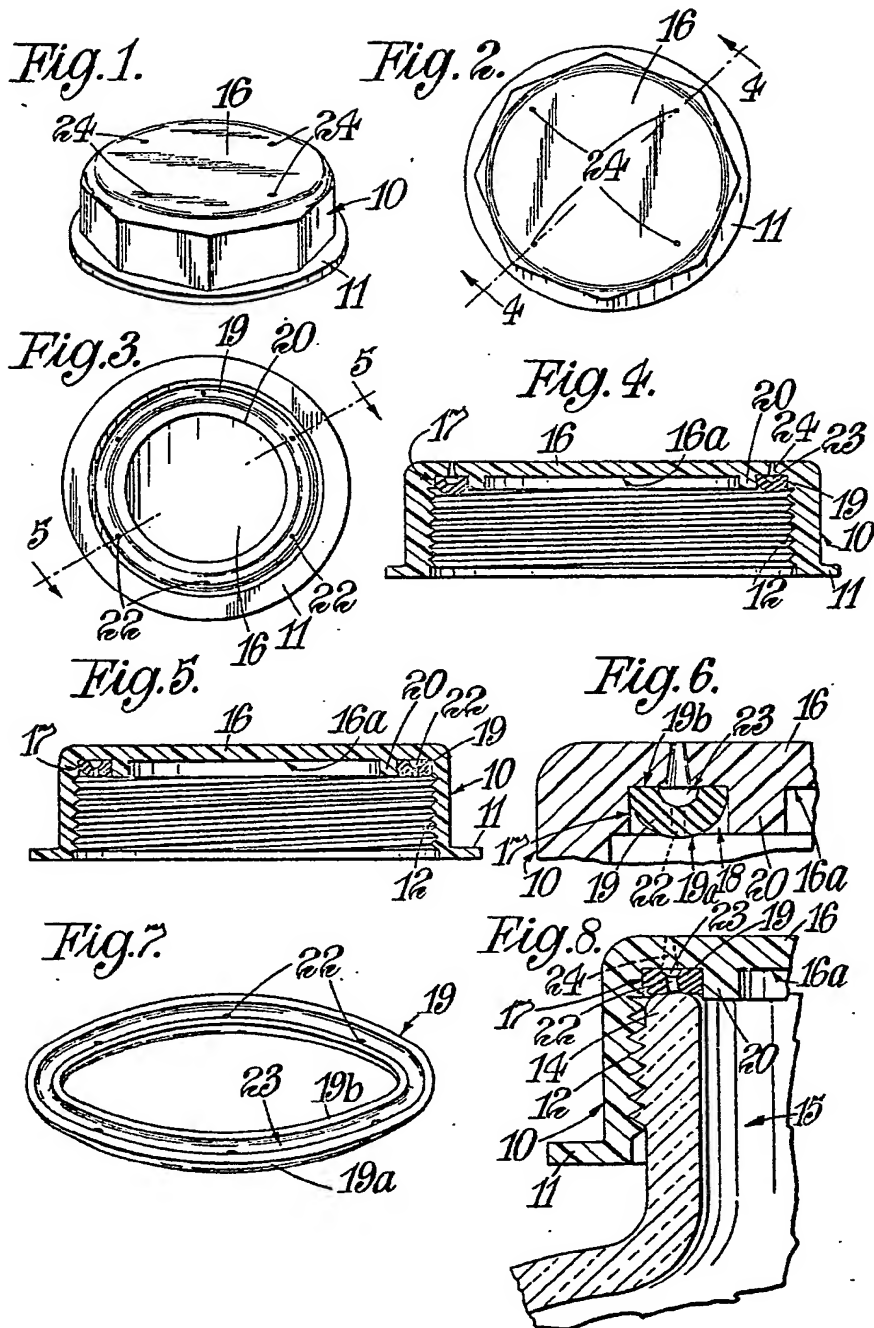
In a preferred construction the washer has six equally spaced perforations which each communicate at one end with the curved surface of the washer and at the other end with the aforesaid annular channel in the flat face of the washer. The width of this annular channel may conveniently be rather greater than the diameter of the perforations. In this preferred construction the cap has four equally spaced perforations lying on a circle which coincides with the circle containing the six perforations in the washer. The diameter of the perforations in the cap may, at the inner face, coincide with the width of the annular channel in the washer, and be less at the outer surface of the cap. It will be appreciated that if the perforations are of these numbers and spacing, there cannot be alignment between more than two of the perforations in the cap and two in the washer, no matter to what position in the well the washer is turned, but if the latter is held in place by adhesive it can readily be so placed that there is no alignment of the perforations.

The invention is not restricted to any particular size of any perforation, either in the washer or in the cap, nor to a particular shape of perforation, as these details can be varied dependent upon the pressure for which it is desired to provide relief. The compression of the washer, which latter will usually be made of rubber, when the cap is screwed home on the container, will partially distort the perforations in the washer. Gas, however, will be able to flow along the annular channel in the washer so as to reach a perforation in the cap. Consequently, although gas escape will be possible, leakage of liquid is unlikely.

It is to be understood that the invention is not restricted to the precise constructional details set forth.

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Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press.—1962.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.



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